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ABSTRACT

This report considers the situation of the Illinois public schools and provides an affirmative argument summarizing the most recent research in four key areas where research has demonstrated that money clearly makes a difference in the quality of the education product: (1) establishing classroom sizes that meet the individual needs of students; (2) enriching course work, programs, and technology available to students; (3) attracting and retaining the most talented individuals to teaching; and (4) financing fixed costs. While money alone does not automatically result in improved achievement, resources are a necessary component to educational improvement. Research findings in these four areas make it clear that greater investment in education not only provides improved student learning, but also assists in future life achievement. Recent analysis of educational spending has indicated that existing programs benefiting at-risk children are the most cost effective and show the most significant promise for gains in student achievement. (Contains 60 references.) (SLD)

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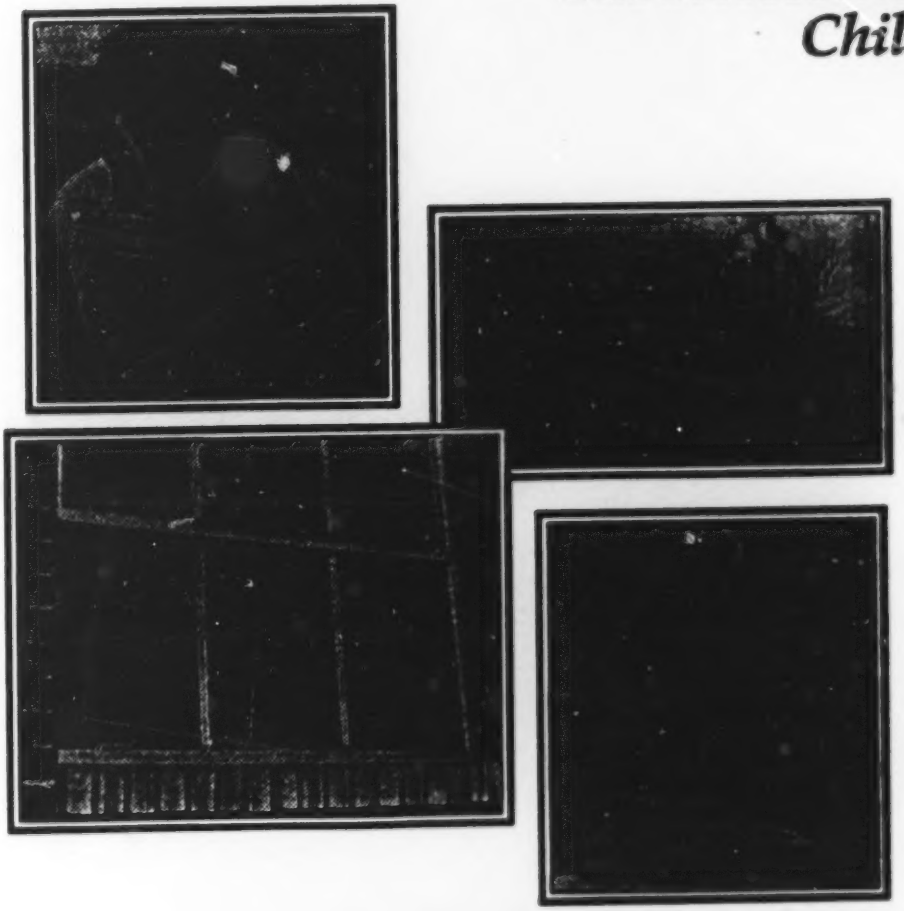
RESOURCES TO FIX SCHOOLS

The Necessities for Educating Children in Illinois



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THE RESOURCES TO FIX SCHOOLS

Illinois state government's investment in elementary and secondary education has declined during the last twenty years. The State's share of monies spent on public education in Illinois has slipped to an all time low of 33%. In the last ten years, Illinois has fallen from 5th in the nation to 47th in the nation in adjusted per capita spending for education (Hickrod, 1992).

The central issue of financing education remains in determining the programs, skills, and investment needed to provide positive learning experiences for children. Although some education research has sought to establish that there is no relationship between resources spent on schools and educational achievement, practioners in the classroom understand the important link between money and learning.

Money matters to principals losing talented young teachers to other school districts offering salaries as much as $10,000 more per year. Money matters to students unable to take introductory computer courses because their schools do not own any computers. Money matters to teachers who lack enough desks, books, and supplies for all their students.

The debate on the impact of money in schools has centered around the highly publicized work of Eric Hanushek, an economist from the University of Rochester. Hanushek analyzed previous studies of resource allocation in schools and concluded that there was little or no systematic relationship between levels of education funding and student outcomes (1986). However, this work was substantially flawed and current research is finding that levels of spending on education do influence levels of educational accomplishment (Baker, 1991 and Laine et al., 1992).

While money alone does not automatically result in higher student achievement, resources are a necessary component to providing students with a high quality education throughout the state. This report provides an affirmative argument summarizing the most recent research in four key areas where money clearly makes a difference in the quality of the educational product:

1. **Establishing classroom sizes to meet the individual needs of students**
2. **Enriching course work, programs, and technology available to students**
3. **Attracting and retaining the most talented individuals to teaching**
4. **Financing fixed costs**

This analysis attempts to bridge the gap between scholarly research and classroom experience, providing basic summaries of recent research documenting linkages between resource utilization and educational programs.

1. ESTABLISHING CLASSROOM ENVIRONMENTS TO MEET INDIVIDUAL NEEDS

Increasing Numbers of Students with Special Needs

The number of children living in poverty in America has increased from 15% in the 1970s to 25% in 1990. Among African American and Hispanic children, roughly one in every two lives in poverty (Children's Defense Fund, 1992). The current gap between the rich and the poor is the widest ever. The number of homeless children has soared to over half a million. In the 1970s, 8 million children were living with only one parent. By 1990 this number increased to 11 million children. The divorce rate has doubled since 1965 (Kantrowitz, 1991). Children and their families are facing increasing obstacles. The number of violent crimes has increased over 15% during the last decade. Children have not escaped the brutality which, in many cases, surrounds them on their way to school, and even in their own homes. An estimated 14% of all children between the ages of 3 and 17 experience family violence (Strauss and Kantor, 1988).

The added stresses of poverty, family separations, and crime have had a profound and detrimental impact on students and their abilities to concentrate on school. In families where the parents have limited educational experiences or face these stresses, the classroom experience may be a child's only chance for educational development. Socio-economic status and family background have long been identified as strong predictors of student achievement. Students whose families live in poverty are more likely to fail in school than are their middle-class peers (National Center of Education Statistics, 1983).

The increasing diversity of the American population places additional demands on our teachers, classrooms, and school system. According to an Educational Research Service report *Cost of Education: An Investment in America's Future*, the percentage of students receiving special education as well as the number of immigrants who need English as a second language has increased substantially. From 1976 to 1984 the number of students served by special education programs increased 18 percent. In addition, between 1976 and 1983, the number of children with limited English proficiency grew 10.3 percent (Robinson and Protheroe, 1987).

Meeting Students' Needs

Many studies have concluded that learning problems occur from failing to meet the individual needs of students who have differing methods of learning (Dunn and Dunn, 1987). Reduced class size gives teachers greater flexibility to use creative teaching practices and more time to devote to each student. In the case of a study involving kindergarten through 2nd grades where the class size was reduced to 15 or less, teachers disclosed that more students mastered the course work because teachers had the opportunity to provide more individualized attention to students (Schultz, 1989).

For low socio-economic and special needs children, small class sizes are particularly important (Summers and Wolfe, 1977). In fact, many educational improvements (ie. quality teachers, pre-school, computer assisted instruction, etc.) tend to benefit more those students with the greatest needs. Nevertheless, educational improvement programs are not without costs. Joseph Murphy and Walter Hack indicate the additional cost of educating a student with need of compensatory education is 1.6 to 2.4 times that of the average student (1983).

Reducing Class Size Results in Higher Student Achievement

Reduced class size provides students with the instruction they need to assist their individual progress. The vast majority of research on class size and student achievement demonstrates that by reducing class size to about 15 students, average test scores rise from the 50th percentile to the 69th percentile (Glass and Smith, 1978).

The relationship of class size to student achievement is one of the most misunderstood areas of educational research. While it is true that incremental reductions of the number of students in a classroom, from 28 to 26, for instance, have no demonstrable effect on student achievement, when class sizes are substantially reduced, student learning increases.

In fact, maintaining a manageable class size has been found to improve teachers' attitudes, satisfaction, and morale in the classroom (Glass et al., 1982). According to a majority of teachers in a 1991 Harris poll, reducing class size would be most helpful to them in being more effective. In intensive studies of teachers' classroom practices, Cahen, Filby, McCutheon, and Kyle revealed that teachers were better able to manage their classes, attend to individual class work, provide in-depth lessons, and present additional curriculum enrichment activities when class size is reduced (1983).

A study by researchers in Tennessee indicated a strong relationship between achievement and class size. The study examined the STAR program that created three types of school classrooms: small classes of 15 students per teacher, regular classes of 24 students per teacher, and regular classes with a teacher's aid. The students surveyed were in kindergarten through third grade in inner-city, rural, urban, and suburban schools. Tennessee's Project STAR showed consistent achievement benefits for kindergarten through third grade students in small classes beyond those achieved by students in the larger classes (Word, 1990).

A follow-up study analyzed the lasting effects of the STAR program by examining the students in the smaller classes to determine any long term benefits from the reduced class sizes. The STAR small class student population now in the fourth grade showed "clear, consistent, and statistically significant advantages over the STAR students from the other two class size conditions on every measure and in all school locations" (Nye, 1991).

Districts with Money Choose to Reduce Their Class Sizes

Reducing class size requires the resources necessary to reduce the student-teacher ratio. The direct correlation between wealth and class size indicates that school districts with choices select smaller class sizes. In a study of Pennsylvania school districts, William T. Hartman reported that wealthy districts averaged 8.5 fewer students per teacher than lower spending districts. In Pennsylvania, higher spending districts spent almost twice as much on instruction as did lower spending districts. Hartman found that more affluent districts in Pennsylvania chose to reduce class sizes and increase the number of student support service staff (1988).

High spending districts are able to provide their students with the effective instruction methods necessary to increase student expertise. In conducting their research on America's schools, John Chubb and Terry Moe found that the top quartile of schools in terms of student achievement spend about 20% more per pupil than schools in the bottom quartile. Those schools that had more money used it to reduce the ratio of students to teachers (1990).

One to One Tutoring

Not only do students benefit from the increased instruction and assistance in small classrooms, but one to one tutoring greatly prevents reading failure and subsequent academic problems for many at-risk students. For instance, Ohio's Reading Recovery project provided one to one tutoring from specially trained and certified teachers. The one to one tutoring program increased student achievement enormously and had lasting effects (Pinnell, 1990).

Individual Instruction Key to Learning

As the difficulties children and their families face increase, schools are being asked to provide more individualized attention to students. Strategies addressing the individual learning methods of students immensely benefit low income and at risk children. Small class sizes and one to one tutoring increase student achievement.

2. ENRICHING COURSE WORK, PROGRAMS, AND TECHNOLOGY

Differences in Instructional Services

Many school systems have diminished expectations of lower-class and minority students' learning, which results in them receiving less academic work, less rigorous work, and being judged against lower academic standard (Good, 1981). Many instructional resources available in schools are scarce, so decisions are made on how to best allocate courses, programs, and technology. Regrettably these decisions often exclude many students from benefitting from these programs.

Michigan State University's William Schmidt concluded that student learning varies substantially with the level of course work taken. The impact of these differences on learning were significant even after adjusting for socio-economic backgrounds of students. These variations led Schmidt to conclude that curricular differences are one of the important determinants of academic achievement and quality of schooling (1983).

Lack of Illinois Course Offerings

A 1990 National Science Foundation study found that Illinois ranked in the bottom quartile of states in percentage of students who take a wide variety of science and mathematics courses. Out of the 38 states surveyed, Illinois ranked 34th in the number of students taking Algebra 2. Only an estimated 40% of students in Illinois took one year of chemistry, placing Illinois 28th out of 38 states surveyed in terms of student enrollment in chemistry courses. Only 20% of all students in Illinois took physics before graduation from high school (Blank and Dalkilio, 1990).

Course Offerings Enhance Student Opportunities

The cost of building science laboratories, purchasing expensive scientific equipment, or updating ever-changing text books prevents many schools from offering the variety of course work needed for their students to be admitted to colleges of their choice and compete in the labor market. In the areas of foreign languages, science, and mathematics, the shortage of teachers has limited schools' ability to expand curriculums to meet the changing demands of international markets and expanding technologies.

In a longitudinal study of over 50,000 students in five states, including Illinois, Penny Sebring reported that students in New York and Pennsylvania completed more years of academic instruction than students in Illinois and two other states. New York and Pennsylvania students received more instruction in English, history/social studies, mathematics, science, and foreign language than Illinois students. Sebring concluded that the differences in courses taken among the students had "important consequences regarding preparation for college entrance examinations and college attendance" (1984).

Difference in breadth of course offerings clearly contributes to the difference between achievement of American and Japanese children. A study comparing the Japanese and Kentucky school systems revealed that an outstanding school in Kentucky offered courses in algebra (two levels), geometry, and calculus while the typical Japanese high school offered algebra, geometry, basic analysis, differential and integral calculus, and probability and statistics. The study concludes that the variation in course offerings and time spent in the classroom account for the difference between U.S. and Japanese mathematics test scores (Yoo, 1987).

Limited access to curricular offerings excludes students from attending an increasing number of colleges and universities. In a 1984 study, the State College Entrance Examination Board reported that many states require or allow state colleges to require entering freshmen to have a prescribed set of high school course work. In general, American colleges have raised their standards for the number and variety of required courses (Goertz and Johnson, 1985). Fully funding curriculums enabling students to attend college or have marketable employment skills will improve learning of students. Students challenged to learn will become more productive citizens.

Computers Aid Learning

Computers are now commonplace in America from top corporations to small businesses. Increasingly, computer skills are becoming a pre-requisite for employment. Not only do students benefit enormously for future employment by being knowledgeable about computers, but computers can also assist instruction in the classroom.

Although earlier studies question the cost efficiency of computer assisted instruction, recent reductions in the price of computers and supporting materials have made computers more affordable. While computers are not a substitute for direct teaching, they do provide significant gains in student achievement when supplemental to quality instructional programs.

A number of studies demonstrate the effectiveness of computer-aided instruction. James Kulik and colleagues at the University of Michigan found that on average students using computers in elementary school out-performed 68% of students taught without computer-assisted materials (Kulik, Kulik & Bangert-Downs, 1985).

For example, the Educational Testing Service and the Los Angeles Unified School District's four year study of the effectiveness of computer-assisted instruction revealed the importance of technology in the classroom. Four elementary schools were studied; half had their students attend 10 to 20 minutes a day at a minicomputer lab while the other half remained in their original classrooms. The computer assisted instruction centered around materials already discussed in the classes. The students participating in computer-assisted instruction performed at the 79th percentile of their class at the end of one year, the 82nd percentile by the end of two years, and the 89th percentile at the end of three years on curriculum specific tests. (Ragosta, Holland, and Jamison, 1982).

Quality Pre-School Strengthens Learning

Illinois children are being denied access to critical pre-school programs. Voices for Illinois Children reported that the majority of Illinois' at-risk children are not enrolled in publicly funded programs (Gilbert and Bush, 1992). For many of these children, the lack of involvement in quality pre-school programs is due to the absence of spaces in these programs. In Chicago, over 30% of all eligible three to five year olds who qualify are unable to find space in Head Start or similar programs (City of Chicago, 1991).

Studies of Head Start programs indicate that children participating in these programs have increased IQ scores and improved behavior in kindergarten and first grade compared to students without pre-school experiences (McKey et al, 1985). Children completing high quality pre-school have fewer failures later in school in terms of retention rates, grade advancements, and special education placement rates than students not attending pre-school (Lazar at al, 1982). A comprehensive study of Head Start by the Administration for Children, Youth, and Families revealed that the vast majority of evaluations of Head Start programs show conclusive cognitive test score benefits, socio-emotional test score gains, and health status improvements to their students (1985).

One of the best documented preschool programs continues to be the Perry Preschool. The Perry Preschool serves 3 and 4 year-olds from families of low socio-economic levels. Longitudinal studies of the program utilized a sample of 113 students who were stratified and controlled by matching IQ, sex, and family background. The Perry Preschool studies demonstrated the benefits of high quality childhood development programs on achievement (Schweinhart and Weikart, 1984).

One longitudinal study of the Perry Preschool revealed that students up to 19 years old who originally attended the preschool outperformed their peers who did not (Berrueta-Clement, 1984). The students involved in the Perry Preschool had higher rates of literacy, employment, and enrollment in post-secondary institutions and fewer numbers of drop outs, arrests, pregnancies, or welfare recipients than those students without pre-school (Schweinhart and Weikart, 1980).

Instructional Programs Improve Achievement

Quality instructional programs prepare children for a variety of challenges. Expanded curriculums, access to technology, and pre-school programs result in increased student learning. Reducing curricular differences received by students as well as expanding educational program opportunities will lead to greater overall achievement.

3. ATTRACTING AND RETAINING THE BEST

Decline in the Pool of Talented Teachers

Colleges and universities are having difficulty attracting the brightest students into education. Students entering the teaching profession score lower on college entrance exams than their counterparts in other subject areas (Vance and Schlechty, 1982). This decline in SAT and ACT scores of students studying education in college indicates the need to strengthen the pool of talented individuals entering the teaching profession.

The supply of teachers has been affected not only by the decline in outstanding applicants, but also by the actual number of teachers pursuing education careers. The Council of Chief State School Officers' national study suggested that roughly one-third of states surveyed are experiencing slight or extreme overall teacher shortages. The Council's study reported that two-thirds of the states are experiencing acute shortages in subject areas such as mathematics, special education, foreign languages, and natural sciences (1986). If this trend continues, the competition to attract quality teachers will increase among states as well as districts.

Teacher Demand in Illinois

According to the Illinois State Board of Education, in the mid-1980s the state began experiencing, for the first time in over a decade, an increase in the demand for teachers. In fact, the total demand in 1985 for elementary, secondary, and special education teachers increased by over 30% from the level in 1984. Combined with a constant supply of teachers, this increase in demand resulted in some teacher shortages. The extent of the problem is particularly evident in the number of vacancies reported in the fall of 1985 doubling from 1983-84 vacancy rate (Bartolini, 1985).

The need for teachers in Illinois varies tremendously as a result of differing geographic locations, salary levels, and subject matter. The State Board believes that moderate shortages currently exist in the fields of special education, mathematics, natural sciences, foreign languages, and bilingual education (1985). The shortage of foreign language teachers in Illinois has been classified as being acute by the Joint National Committee for Languages. The Committee concluded that due to lack of funding, Illinois could not offer sufficient financial incentives to attract foreign language teachers to the state (Draper, 1988).

Quality Teachers Are Critical to Learning

School improvement is contingent on the quality of staff responsible for implementing reform. Certainly, teachers have the most direct impact on students' classroom experiences. Although attaining advanced college degrees by teachers has not been shown to improve student learning, quality teachers do exhibit special skills. Quality teachers are able to direct more time to learning, motivate, provide individual feedback, set high expectations for all students, be role models, engage students in active learning, and manage classrooms well (Anderson, Evertson, and Brophy, 1979). As the communicators of knowledge and motivators of learning, the caliber of teachers plays a critical role in student achievement (Murnane and Phillips, 1981 and Turner, 1988).

Teachers Leaving Due to Poor Pay

High teacher turnover can be costly to students in terms of the loss of experienced instructors. Similar to most professions, teaching has a learning curve in which during the first several years teachers steadily improve their abilities to teach. Harvard University's Richard Murnane found that, controlling for all other variables, teachers with several years of experience were able to improve the levels of achievement of their students on standardized tests to a greater degree than starting teachers (1975).

The decline in inflationary adjusted teacher salaries has a dramatic impact on decisions to leave the teaching profession, especially on individuals with multiple career options. Controlling for inflation, teachers salaries in the U.S. reached their highest level in 1971 and by 1987 average teacher salaries had declined from their 1971 level by $1,000 (Murnane, Singer, and Willett, 1989). A Harris Poll revealed that 60% of former teachers reported that salaries were the most significant reason why they left teaching. The poll also indicated that the new median income for those teachers who have left the profession is about 19% more than the average teacher salary (1985).

Several studies have investigated the extent of the relationship between salaries and teacher retention. Murnane, Singer, and Willett, in a study of North Carolina teacher career choices, determined that increases in teacher salaries improve the likelihood of a teacher remaining in teaching. They estimated that an additional $2,000 in the average salary for a teacher in 1987 would have kept teachers in the classroom an average of two additional years (1989).

Other studies have found the same direct relationship between salary level and staff retention. Bill Rickman and Carl Parker conducted a study on the effects of wage differentials between teachers' salaries and alternative professions' wages using Current Population Survey data. They concluded that each 1% increase in teachers' wages would decrease the risk of teachers leaving by 2% (1990).

Salaries Must Be Competitive

In an analysis based on the 1983 Current Population Survey of the U.S. Bureau of the Census, Ronald Bird of the Southeastern Regional Council for Educational Improvement concluded that teachers' annual salaries are insufficient to attract large numbers of college educated individuals into the profession (1985). The lack of competitive salaries especially limits the number of minority students entering the profession (Murnane, 1975).

Based on the U.S. Census Bureau's 1984 Survey of Income and Employment, Bird established that teachers' salaries are roughly $10,000 less than those non-teaching college-educated workers with similar socio-demographic characteristics (1985). For example, the average salaries in 1986 for engineers and accountants were $39,500 and $31,300 respectively, while the average salary for teachers was $23,500 (Carnegie Foundation, 1986).

Teacher Professional Development

For reform to occur in the classroom, it is critical for teachers and staff to master effective teaching techniques, learning theories, and organizational theory. Professional development necessarily involves updating and refining one's skills on a regular basis. Ernest L. Boyer points out in his book High School that "At local schools, staff development programs are often nonexistent, and programs are weak... Excellence in education will be achieved only as we invest in the education of teachers in the classroom" (1983).

Most professional service sector industries in the U.S. devote considerable resources to the continuing education of their employees. In Chicago, the Board of Education spends less than $100 per teacher on staff development, while many top corporations spend over $1,000 per employee per year.

Quality staff development can increase student learning. Not only does staff development improve individual teaching techniques, but the training can help schools develop comprehensive learning systems (Joyce and Showers, 1988).

Benefits of Investing in Human Resources

Quality teachers remain critical to improving student learning. Adequate resources are necessary to attract high caliber students into the teaching profession, provide continual professional development, and provide incentives to retain effective teachers in the classroom.

4. FINANCING FIXED COSTS

Basics Must Be Maintained

A report entitled "Wolves at the Schoolhouse Door" by the Education Writers Association found that 25% of the nation's school buildings are shoddy and inadequate, while another 33% are in need of more space due to increasing enrollment. More than half of all current schools were built before World War II or during the 1950s and 1960s, a time of cheap and quick construction (Lewis, 1989). "Schoolhouse in the Red" issued by the American Association of School Administrators revealed that one child in eight in the U.S attends a school which is environmentally unsafe, structurally unsound, or both (Hansen Associates, 1992).

The physical condition of educational facilities has an impact on learning. The Carnegie Foundation in 1988 reported that students' attitudes about education were directly related to their surroundings. An independent study in 1991 of the Washington D.C public schools found that students' achievement on standardized tests would be 5 to 11 percent higher if the physical conditions of their buildings were improved (Edwards, 1991).

Utilities

Schools are not immune to increasing energy costs that have affected every other sector of America. According to the American Association of School Administrators, school utility costs increased 11 percent from 1989 to 1990 and increased another 7 percent from 1990 to 1991 (1991). Like many long term savings measures, energy conservation requires the initial resources to enable improved efficiencies. Although the initial expenses for energy conservation programs nationally are estimated to be about $5 billion, America's schools could likely save roughly 25% of their utility bills through more effective energy management.

Health Care

Education is a labor intensive service area where staffing costs comprise roughly 80% of most district and school budgets. It should come as no surprise that skyrocketing health care costs have a tremendous impact on total costs. In Chicago, health care and dental costs for the public schools have steadily increased. Actual health care expenditures rose 3% or $4 million from fiscal year 1990 to 1991.

CONCLUSION

Reducing Racial Disparity

Greater investment in education not only provides improved student learning, but assists in future life achievement. David Card and Alan Krueger, of Princeton University have concluded that the strongest factor in reducing the gap between African American and White earnings in the South over the past seventy years has been the return from increasing the quality of education for African Americans over that period, even to a greater degree than protections afforded by Civil Rights legislation. As schools attended by African Americans reduced the ratio of students to teachers, increased average term length, and raised annual teacher salaries, African American wages grew. Improved school quality and the resulting economic return can explain 15 to 25 percent of the narrowing of the wage gap between African American and White workers between 1960 and 1980 in the South (1990).

The rate of return of the programs outlined in this paper benefit all students and in particular low-income and minority children. Recent analysis on current spending indicates that existing programs benefitting at-risk children are the most cost effective and show the most significant promise for gains in student achievement (Levin, 1989).

Resources are the Key

In New Hampshire a blue ribbon committee examined the impact resources have on education quality. Based on an in-depth case study of eight schools representing high and low spending schools in the state, it reported that money made a difference in schools' ability to attract and retain the best teachers and principals. The committee found that the number of talented persons at low spending schools declined because they were unable to pay high salaries. They concluded that "schools with low expenditures are limited in virtually every dimension: a narrow range of subjects taught, inadequate instructional equipment, insufficient supplies, poor facilities, and unsatisfactory working conditions for students and teachers" (Center for Educational Field Services, 1984).

High Achievement Possible

The late Ron Edmonds, one to the early pioneers of effective schools insightfully commented that "We can, whenever and wherever we want, successfully teach all children whose schooling is of interest to us. We already know more than we need to do that. Whether or not we do it must depend on how we feel about the fact we haven't so far" (1979).

The programs, knowledge, technology, and individuals are potentially available to guarantee that all children realize their full potential. Support must be garnered to reduce class size, increase early childhood programs, enhance computer learning, provide individual attention, attract and retain quality teachers, and provide positive learning environments for all children. All children can learn if given the chance.

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